PERSONAL INCOME TAX POLICY

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Abstract: *Personal income tax policy generally does not make distinction regarding people with disability on the one side, and non-productive employed persons. To prove "non-discriminatory" approach in personal income tax policy, standard non-linear model and the commodity taxation framework has been used. In this analysis have been used also two assumptions. The first one is differential understanding of taste of leisure regarding person with disability and ordinary person. The second is meaning of expected limitation in activity for persons with disability. Leisure could be dependable on commodity combination and on income tax redistribution from early to latter taxation. To avoid problems with financial crisis from 2008 analysist was concentrated in period before 1975-2005. Regarding countries located in western Balkan they are still in the beginning of diversified personal income tax policy related to unemployed people with disability and employed people without disability. The main source of income for government budget is still VAT. Currently VAT in Serbia is 20% and in Croatia 25%. These percentages are extremely high compared to province of Ontario where is HST "only" 13% and HST cold be accepted as VAT in EU and all other countries in Europe. European countries still hast to make major reform in tax policy and provide for government budget stronger impact of personal income tax, than any tax related to the sale price.*

Keywords: *tax policy, productivity, disutility of labor, leisure, consumption, commodity taxation*

INTRODUCTION

Optimal redistribution programs have raised much interest in the public economics literature and in the policy debate. Most contributions in the area deal with the question of how best to balance equity and efficiency in a context where individuals differ in their productive capacity and the government seeks to redistribute income from high-to-low-productivity individuals. In this research it was tried to add an additional dimension to the problem: the disutility of labor. It can receive two alternative interpretations: either taste of leisure or pain caused by disability. Hence individuals with the same productivity and disutility of labor may differ, owing to the reasons underlying their disutility of labor. The government may be willing to redistribute, among individuals with the same productivity

towards disabled individuals because they are not responsible for their impairment. The object in this research is to provide some insights into the optimal redistribute policy within this context.

The treatment of problem follows the optimal non-linear income taxation literature. In other word, it was analyzed optimal redistribution policy of a government that maximizes a social welfare function and is constrained by some asymmetry of information. There is a current strand in the literature that recognizes that individuals may differ in more than one relevant characteristic that the government cannot observe. Beaudry and Blackorby[1] assume that individuals may participate in different productivities in these two sectors, both unobservable to the government. However, the most common setting in the optimal taxation literature with two adverse selection parameters is that individuals participate in market activities and differ with respect to productivity and labor disutility. The main objective is to capture the idea that earning differences tem from two different sources: labor productivity and leisure taste. Optimal policy in such a setting departs from the standard Mirrlees approach in two ways. First, with two unobservable characteristics, binding self-selection constraints are less predictable. Second, redistribution along the productivity axis is often presented as more legitimate than redistribution along the taste axis.

In a contribution close to this research paper, Cuff (2000)[2] analyses the issue of optimal workfare in a setting where workers have different disutility of labour. She observes that high disutility of labour can receive two alternative interpretations: disability or low-productiveness. She then argues that the government may or may not want to redistribute towards individuals with high disutility of labor, depending on the interpretation. The gist her argument is close to Roemer's (1998)[3] idea that redistribution is legitimate when individuals are not responsible for their needs.

For the purpose of this research work, have been considered individuals that may differ in productivity but that have the same disutility of labor. However, among low-productivity individuals, there are simultaneously both disabled and lazy ones. That is what was made assumption that in a first-best setting, the government would like to redistribute from lazy to disabled individuals, even if they have the same productivity. This entails a non-welfarist criterion, since individual utilities are exactly alike. More precisely, the government is assumed the weight more heavily the disutility of labor of disabled individuals. However, in a second-best setting where asymmetry of information prevents the government from distinguishing these individuals, there is no possible redistribution unless low-productiveness and disabled individuals use their otherwise identical disposable income differently and the government can observe their consumption choice. Blackorby and Donaldson have already treated the use of the consumption as bundle screening device in related context. Here were considered two types of consumption goods and show that, given that the consumption patterns of lazy and disabled individual differ, commodity taxation may be desirable for redistribute purposes. This is in contrast to the Atkinson and Stiglitz's research proposition, which shows that in their setting it, is superfluous one optimal non-linear income taxes are in place.

1   Beaudry P., Blackorby C. and Donaldson D., "Taxes and employment subsidies in optimal redistribution program", IDEP,DT 05/99, pages 173-78.

2   Cuff K. (2000), "Optimal of workfare with heterogeneous preferences", Canadian Business and Economics 44, pages 188-193.

3   Roemer J., (1998), " Equality of opportunity", Cambridge, Harvard University Press.

Regarding countries from "western" Balkan there is still no proper tax and pension system. Differences between gross and net wages are relatively high and for example in Macedonia 47% of gross salary would be accumulated by government budget. Bulgaria has higher percentage of 52%, Serbia 64%, Slovenia 74% and Romania%.

The tax system in Canada is the one example how could be reformed the tax system in the countries of "western" Balkan.

1. INDISTINGUISHABLE TYPE

The individuals who differ in productivity but have formally the same disutility of labour have been considered. However among low-productivity individuals, both types have been examined, disabled and lazy ones. There is assumption that productivity can take two positive values, Φ_k and Φ_h, with $\Phi_h > \Phi_k$. Type-h individuals have a higher productivity in the private labor market than type-k individuals. The distribution of Φ is common knowledge. Our society consists, then, of three types of individuals: disabled and lazy low-productivity individuals and high-productivity individuals, and 1, 2, and 3 denoted them, respectively.

In order to understand some of the implications of these assumptions, it may be worthwhile contrasting setting with that of Cuff. For this purpose, let use **Table 1**. As already mentioned, Cuff considers a society in which individuals differ both in productivity and disutility of labour and in which the disutility of labour can receive two alternative interpretations: either disability or low-productivity. That type society consists of three types of individual: high-productivity individuals have only low disutility of labor but low-productivity individuals may have either low or high disutility of labor. Depending on the interpretation given to high disutility of labour, there are two possible scenarios. When high disutility of labour stems from disability, the society consists of individuals of types 1, 4, and 5. In the maximin logic adopted by Cuff, the government tries to redistribute towards type-1 individuals[4].

In this framework there are individuals types 1,2, and 3, assuming, thus that both low-productivity and disabled individuals coexist. In addition, although they formally have the same disutility of labor, they may use their disposable income, which we denote by α_i in different ways. In order to capture this idea, there is used following utility function:

$$T_i = q_i + t(h_i - \hat{h}_i) - s(r_i) ; i=1,2,3, \tag{a}$$

Where q_i and h_i represent two consumption goods and r_i denotes labor supply. According to (a), type "i" individuals derive utility from only the units of the second good consumed above $\hat{h}_i$. This is good like health care for which disabled individuals have relatively higher need. Accordingly, it is posit: $\hat{h}_1 = \hat{h} > \hat{h}_2 = \hat{h}_3 = 0$. In line with **Table 1**, there is also $\Phi_1 = \Phi_2 = \Phi_k$. Furthermore, the utility functions are quasilinear in the first consumption god, $t(\cdot)$ is a continuous, differentiable, strictly increasing, and strictly concave function, and $s(\cdot)$ is strictly convex.

In a laissez-faire market economy, each individual maximizes

$$T = (\Phi_i k_i - h_i) + t(h_i - \hat{h}_i) - s(r_i),$$

Where the per unit costs of production are assumed to be constant, with one unit of

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4   I.e. the disabled-low productivity individuals

effective labor being necessary to produce one unit of either good. The disposable income, $d_i(=\Phi_i k_i)$, is devoted to consumption of goods q_i and h_i. Clearly, in a laissez-faire economy, $k_1=k_2<k_3$, h_1-$\hat{h}$=h_2=h_3 (hence, $h_1>h_2=h_3$) and q_1=<q_2<q_3, where d_1=d_2-$\hat{h}$. Note that the disposable incomes are such that d_1=d_2<d_3. That is, both disabled and low-productivity individuals work and earn the same. The only difference is that they use their disposable income differently. Since disabled individuals, have higher needs of commodity "h", they enjoy lower consumption of commodity "q" than lazy ones. This may seem unfair and provides some justification for redistribution from low-productivity to disabled individuals.

Table1. Comparison of this setting to that of Cuff

Disutility of labour	Problem workers	Low productivity	High productivity
High	Disability	1	
	Laziness	2	3
Low	Hardworking	4	5

In order to analyze this redistribute issue, it has been considered now a social planner's solution where there is full observability of each individual's productivity and kind of labor disutility. Given the quasi-linearity of individual utilities, this has been used a concave social utility transformation $G(\cdot)$ to account for the redistribution concern. Further, the social planner acknowledges that the disutility of labour for disabled individuals (i.e. type 1) does not have the same social cost as the disutility for the two other types. It thus puts a higher weight $y_1>1$ (= y_2 = y_3) on it. In other words, disutility of labour of disabled individuals is more heavily weighted in the social welfare function than that of lazy ones. Implicit to this approach is the idea that the disabled worker contrary to the lazy one ought to be compensated for his-her handicap. An alternative specification would be to put a higher weight on $D(T_1)$. Doing so is consistent with the Pareto efficiency principle, but it implies that the disabled individual is entitled not only to work less in the first –best optimality solution but also to consume more. By restricting the higher weight to the disabled worker's disutility, it was avoided such and outcome but is opt to the criticism of Pareto inefficiency. What is important to note is that the qualitative findings are independent of which of these two specifications is chose.

With full information, the problem of the planner – who controls each individual's labor supply and consumptions – can now be expressed by the following Lagrangean expression:

$$\overset{3}{\underset{i=1}{\pounds}} = \Sigma \, n_i \, [D(q_i + t(h_i - \hat{h}_i) - y_i s(k_i) + \mu(\Phi_i k_i - q_i - h_i)] , \qquad (b)$$

where n_i is the proportion of type $\tilde{\imath}_s$ individuals in the population and $v_1>1$=v_2=v_3. In what follows, we will denote the argument for i=1 of D by $\check{T}_1$, which differs from T_1, owing the presence of weight $v_1>1$.

The first-order conditions imply

$$G'(\check{T}_1)=G'(T_2)=G'(T_3) = \mu, \text{ and thus } \check{T}_1=T_2=T_3 \qquad (c)$$

$$t'(h_i - \hat{h}_i) = t'(h_2) = t'(h_3) = \text{ and thus } h_1 - \hat{h} = h_2 = h_3 \qquad (d)$$

$$v_1[v'(k_1)/\Phi_k]=[v'(k_2)/\Phi_k]=v'(k_3)/\Phi_z, \text{ and thus } k_1<k_2<k_3. \qquad (e)$$

In contrast to the laissez-faire economy, disabled individuals have worked less than lazy ones. This follows from the fact that the government attaches more weight to the disutility of labor of disabled individuals (i.e. $v_1>1$). Disposable incomes are such that $y_3>y_2$ (i.e. they consume the same amount of commodity h, but $q_1>q_2$), but $y_2><y_1$ and $y_3><y_1$, depending on v_1 and Φ_z/Φ_k. Decentralization of this first-best optimum requires some lump-sum taxes and transfers between individuals plus an "ad valorem" tax on individual 1's earnings.

The social objective can be in contrast and used here with alternative social objectives. If the planner did not attach more weight to the disutility of labor of disabled individuals (i.e. $v_1=1$), the results concerning both low-productivity individuals would be $k_1=k_2$, $h_1-\hat{h}=h_2$ and $q_1=q_2$ (hence, $y_1>y_2$), since low-productivity and disabled individuals have different preferences with respect to commodity h to those individuals with higher needs. However, both low-productivity individuals work the same amount of time. If, instead, $v_1>1$ is applied to the utility function of the disabled individual (not just the disutility of labor), k1<k2 and $h_1-\hat{h}>h_2$, but the relationship between the q_j and y_j remains ambiguous. With this specification, decentralization does not require any distort tax; lump-sum taxes and transfers would suffice to achieve the optimum.

To achieve the first-best solution it need perfect observability of both individuals' characteristics. In the absence of perfect information, such a solution clearly would not be sustainable. Consider, first a situation where the government observes only pre-tax and post-tax (or disposable) income. That is $f_i=\Phi_i k_i$ (but not Φ_i and k_i separately) and y_i (but not q_i and h_i separately). With a non-linear income tax schedule, this is equivalent to saying that the government controls them. It can be shown that high-productivity individuals would have incentives to mimic low-productivity ones. On the other hand, lazy individuals would not be distinguished from disabled ones.

The first problem can be solved, at the expense of some efficiency, by following the Mirrlees-Stiglitz approach. In the labor earning-disposable income space, the indifference curves of individuals with different productivities differ (i.e. it is more costly for a low-productivity individual to earn an additional dollar of income, and, accordingly, she needs to be compensated with the higher amount of disposable income to stay on the same indifference curve). The planner can exploit this information in order to separate high-productivity from low-productivity individuals. However, the problem involving the two types of low-productivity, individuals cannot be solved as long as the government observes only disposable income, not its decomposition between consumption goods q and h. There are no observable variables that allow for sorting out disabled from low-productivity individuals. In other words, these two types are indistinguishable. One possibility would be to consider the use of the consumption choices made by individuals, assuming that this information is made available to the government. If government observes consumption of q and h, this information may be useful for redistribute purposes.

2. CONSUMPTION AS A SCREENING DEVICE

Now the attention has been given to the case where government is able to observe the consumption levels of q_i and h_i, together with labour earnings f_i (that is, $f_i = \Phi_i k_i$, but not Φ_i and k_i separately). The first-best can be shown to be not attainable: high-productivity individuals have incentives to mimic low-productivity ones, low-productivity individuals have incentives to mimic low-productivity ones, and low-productivity individuals have incentives to mimic disabled ones. In the proof that follows, we express the utility functions in terms of the variables the government is able to observe (i.e., q_i, hi, and fi).

The proof is by contradiction. Let us then suppose that the above policy instruments enable the government to decentralize the first-best. It can first be easily shown that in this first best allocation, low-productivity individuals are strictly better off with the treatment designed for the disabled individuals, and they therefore mimic them. The first best implies

$q_1 + t(h_1 - \hat{h}) - v_1 s (f_1/\Phi_k) = q_2 + t(h_2) - s(f_2/\Phi_k),$

and h1= $\hat{h}$. Hence, $t(h_1 - \hat{h}) = t(h_2)$ and $q_2 - s(f_2/\Phi_k = q_1 - v_1 s(f_1/\Phi_k)$. Since $v_1 > 1$, and $q_1 - v_1 s(f_1/\Phi_k) < q_1 - s(f_1/\Phi_k)$, which, together with $t(h_1) > t(h_2)$, implies

$q_2 + t(h_2) - s(f_2/\Phi_k) < q_2 + t(h_1) - s(f_1/\Phi_k).$

Similarly, it can be shown that high-productivity individual have incentives to mimic low-productivity ones (i.e. the high-productivity individual is strictly better off with the treatment designed for the low-productivity individual). The first-best implies:

$Q_2 + t(h_2) - s(f_2/\Phi_k) = q_3 + (h_3) - s(f_3/\Phi_z),$

And $h_2 = h_3$. Hence, $t(h_2) = t(h_3)$ and $q_2 - s(f_2/\Phi_k) = q_3 - s(f_3/\Phi_z)$.

Since $f_i = \Phi_z k_i$ and $\Phi_z > \Phi_k$, $q_3 - s(f_3/\Phi_z) < q_2 - s(f_2/\Phi_z)$.

Hence $q_3 + t(h_3) - s(f_3/\Phi_z) < q_2 + t(h_2) - s(f_2/\Phi_z)$.

Accordingly, in an imperfect-information framework, we need to introduce two self-selection constraints in order to make this mimicking behaviour unattractive, namely, the constraints concerning type-2 individuals mimicking type-1 ones and type-3 individuals mimicking type-2 ones. The other self-selection constraints are not binding, in particular, the one concerning type-3 individuals mimicking type-1 ones. If type-2 individuals are not induced to mimicking type-1 ones, there is no way for type-3 individuals to be attracted by the consumption vector of type-1 ones. The second-best problem is then the following:

$\underset{i=1}{\overset{3}{Max \Sigma}} n_i D [q_i + t(h - \hat{h}_i) - v_i s(f_3/\Phi_z)]$ \hfill (f)

q,h,f

s.t.

$$(\mu): \sum_{i=1}^{3} n_i (f_i - q_i - h_i) \geq 0 \tag{g}$$

$$(\delta_1): q_2 + t(h_2) - s(f_2 / \Phi_k) \geq q_1 + t(h_1) - s(f_1/\Phi_k) \tag{h}$$

$$(\delta_2): q_3 + t(h_3) - s(f_3/\Phi_k) \geq q_2 + t(h_2) - s(f_2/\Phi_z), \tag{i}$$

where the non-negative dual variables of the budget and incentive-compatibility constraints are indicated on the left. Multiplier δ_1 is associated with the incentive-compatibility constraint that ensures that a low-productivity lazy individual has no incentives to mimic a low-productivity disabled one, and multiplier δ_2 is associated with the self-selection constraint that prevents a high-productivity individual from mimicking a low-productivity one.

The first-order conditions for a maximum are:

$$q_1: n_1[D'(\check{T}_1) - \mu] - \delta_1 = 0$$

$$h_1: n_1[D'(\check{T}_1)t(h-\hat{h})\mu] + \delta_1(1/\Phi_k)s'(f_1/\Phi_k) = 0$$

$$f_1: -n_1[D'(\check{T}_1)(\delta_1/\Phi_k)s'(f_1/\Phi_k) - \mu] + \delta_1(1/\Phi_k)s'(f_1/\Phi_k) = 0$$

$$q_2: n_2[D'(T_2 - \mu)] + \delta_1 - \delta_2 = 0$$

$$h_2: n_2[D'(T_2)t'(h2) - \mu] + (\delta_1 - \delta_2)t'(h_2) = 0$$

$$f_2: -n_2[D'(T_2)(1/\Phi_k)s(f_2/\Phi_k) - \mu] - \delta_1(1/\Phi_k)s'(f_2/\Phi_k) + \delta_2(1/\Phi_z)s'(f_2/\Phi_z) = 0$$

$$q_3: n_3[D'(T_3) - \mu] + \delta_2 = 0$$

$$h_3: n_3[G'(T_3)t'(h_3) - \mu] + \delta_2 t'(h_3) = 0$$

$$f_3: -n_3[D'(T3)(1/\Phi_z)s'(f3/\Phi_z) - \mu] - \delta_2(1/\Phi_z)s'(f_3/\Phi_z) = 0$$

For the self-selection constraints to be satisfied, q_1, q_1 and q_3 must be chosen appropriately. Combining the first-order conditions for the q_s yields

$$\mu = [n_1 D'(\check{T}_1) + n_2 D'(T_2) + n_3 G'(T_3)] / (n_1 + n_2 + n_3) . \tag{J}$$

This provides the marginal cost of public funds. An additional unit of revenue is obtained by reducing uniformly the q_s, which keeps satisfied the self-selection constraints. Furthermore,

$$D'(\check{T}_1) = \mu + (\delta_1/n_1) > \mu \quad (K) \quad \text{and} \quad D'(T_3) = \mu + (\delta_2/n_3) < \mu . \tag{L}$$

This meant that it would be welfare improving to reduce q_3 in order to increase q_1.

However, this would violate the self-selection constraints, which shows the limits to redistribution. The welfare-improving change in q2 is of ambiguous direction because it depends on the sign $\delta_1 - \delta_2$.

The optimality conditions for high-productivity individuals regarding consumption of commodity h and labour supply are the same as in the first-best. Not surprisingly, there is no distortion at the top:

$$t'(h_3) = 1 \text{ and } s'(f_3/\Phi_z) = s'(k_3) = \Phi_z. \tag{M}$$

Given the linearity of the individual utility function with respect to q_i this means that the high-productivity individual consumes the same amount of h and provides the same amount of labour as in the first-best.

For low-productivity individuals, we have

$$T'(h_2) = 1 \quad (N) \text{ and}$$

$$s'(f_2/\Phi_k) = s'(f_2) = \Phi_k\{1 + (\delta_2/\ \delta_2 + \mu n_2)] / [s(f_2/\Phi_z)/\Phi_z] - 1\} < \Phi_z \tag{O}$$

They consume the same quantity of commodity h in the first-best, by they are induced to work less. This is in order to prevent high-productivity individuals from mimicking them.

For low-productivity disabled individuals, we obtain

$$t'(h_1-\hat{h}) = \{1 - f_1[t'(h_1-\hat{h}) - t'h_1)]\} / n_1\mu < 1, \text{ and} \tag{P}$$

$$s(f_1/\Phi_k) = s'(k_1) = \Phi_k / f_1 + (f_1/n_1\mu)(f_1-1) < \Phi_k/f_1. \tag{R}$$

In the second-best, h_1 is higher and k_1 is smaller than in the first-best. The reason why disabled individuals are induced to work less differs from the on just stated for low-productivity ones. It stems from $f_1 > 1$ (i.e., the concern of the government for the disabler's disutility of labour). Indeed, if we had $f_1 = 1$, condition (R) would yield $s'(f_1/\ \Phi_k) = \Phi_k$.

These results deserve some further comments. In the second-best, with three types of individuals, both low-productivity types have worked less than in the first-best. However, as mentioned above, they do so for different reasons. It may be worth contrasting this outcome with that obtained in a second-best with only low-productivity and disabled low-productivity individuals. If society consisted of low-productivity and disabled individuals of the same productivity, the supply of labor of low-productivity individuals would not be distorted at the margin, whereas disabled individuals would be induced to work less than in the first-best. Thus, h_1 is higher and k_1 is smaller than in the first-best, yet this package is less attractive to low-productivity individuals than the one designed for then in which they work more ($k_2 > k_1$) and consume less of commodity h($h_2 < h_1$). To ensure hat the self-selection constraint is satisfied, it is need to have $q_2 > q_1$. Actually, it is not impossible that in this second-best setting, disabled individuals do not work at all.

As is standard, the optimal allocation resulting from solving the above problem can be implemented by means of tax/subsidy schedules. Above has been described the second-best resource allocations. The problem has been posed as if the government confronted the indi-

vidual with a choice of thee bundles, (q_i, h_i, f_i), i=1,2,3. To decentralize the optimal alloca-
tion, the tax function must pass through the points (q_i, h_i, f_i), i=1,2,3 and elsewhere must lie
below the indifference curves through (q_i, h_i, f_i). Given such tax schedule, individual i(=1,2,3)
clearly will choose the point (q_i, h_i, f_i).

IN the present case, the tax system consists of combination of taxes/subsidies on la-
bour earning and on commodity h. The tax schedule with non-linear income and non-linear
commodity taxes is

$$P_i = P(f_i) + p(h_i).$$

Labour earning are devoted to the consumption of commodities q and h and to the
payment of income and commodity taxes:

$$q_i = f_i - P(f_i) - h_i - p(h_i).$$

The individuals' first-order conditions yield:

$$-(\partial T_i/\partial f_i) / (\partial T_i/\partial q_i) = 1 - P'(f_i) \text{ and } -(\partial T_i/h_i) / (\partial T_i/\partial q_i) = -1 -h'(f_i)$$

Since

$$-(\partial T_i/\partial f_i) / (\partial T_i/\partial q_i) = (1/\Phi_i)s'(f_i/\Phi_i) \text{ and } -(\partial T_i/h_i) / (\partial T_i/\partial q_i) = -t'(h_i - \hat{h}_i)$$

we obtain the following expressions for the marginal tax rates on income and commod-
ity h, respectively:

$$P'(f_i) = 1- (1/\Phi_i)s'(fi/\Phi_i), \text{ and } p'(h_i) = t'(h_i - \hat{h}_i) - 1$$

Using (M), (N), (O), (P) and (R) it was obtained

$$P'(f_1)=0 \text{ and } p'(h_3)=0, P'(f_2)>0 \text{ and } p'(h_2)=0; P'(f_1)>0 \text{ and } p'(h_1)<0.$$

There is no marginal distortion of labor supply or consumption of h for high-produc-
tivity individuals. Low-productivity individuals' income is taxed at the margin to prevent
high-productivity individuals from mimicking them. And disabled individuals face both a
marginal tax on income and a marginal subsidy on consumption of good h. As noted above,
the marginal tax on income for disabled individuals is due to the higher weight the govern-
ment places on the disutility of labor of this type of individual.

3. CONCLUSION

The motivation behind this paper stems from the observation that the disutility of labor
can receive two different, though reasonable, interpretations: low-productivity or disability.
When this is the case, an optimal income tax cannot separate those two types of individual
if those types are not observable. Yet one would like to redistribute from those with taste for

leisure to those with some sort of disability. It was shown that, given that their consumption pattern is likely to differ, it should use commodity taxation to achieve some redistribution. Indeed, one can design a tax/transfer package that results in the disabled individuals' being induced to work less or even not at all, whereas the low-productivity individuals will be led to work while being financially compensated.

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